



	Polarized targeting	Transmembrane	G1
Arabidopsis	YGRDPWGGPLEINTADSDDDRRSNLNDLDRALSPP	YVDLGGCIIVSRKIFVWTVGTVLVAALLAGFITLIVKTVPRHHPE	PPPPNYTTTALHKLKE
Brassica	YGRDPWGGPLEIHATDSATDDDRSNLNDLDRALSPP	YVDLGGCIIVSRKIFVWTVGTVLVAALLAGFITLIVKTVPRHHPE	PPPPNYTTTALHKLKE
Cotton	YGRDPWGGPLEINATDSATDDDRSNLNDLDRALSPP	YVDLGGCIIVSRKIFVWTVGTVLVAALLAGFITLIVKTVPRHHPE	PPPPNYTTTALHKLME
Tomato	YGRDPWGGPLEIHTADSDDDDRSNLNDLDRALSPP	YVDLGGCIIVSRKIFVWTVGTVLVAALLAGFITLIVKTVPRHHPE	PPPPNYTTTALHKLME
Arabidopsis	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF
Brassica	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF
Cotton	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF
Tomato	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF	YNAQKSGKLPKHHNVSRGNSGLQDQKSGTGSF
Arabidopsis	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT
Brassica	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT
Cotton	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT
Tomato	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT	DPNDHYCWMRPEDMDYKRPVTT
Arabidopsis	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP
Brassica	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP
Cotton	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP
Tomato	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP	HAGAFWGGFYGVFSDNKLKLAGAQLLSRLRLFLSPGYPYEEILRTHFNQTSIVMCSYLP
Arabidopsis	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT
Brassica	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT
Cotton	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT
Tomato	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT	RDFARSQIDYILGKNPRKMSYVVGFGT
Arabidopsis	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP
Brassica	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP
Cotton	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP
Tomato	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP	TIFSAPVPLFPPTPPPPAPWKP

Figure 1

REPLACEMENT SHEET

APPLN. FILING DATE: DECEMBER 12, 2003

TITLE: METHODS AND MEANS FOR MODULATING
CELLULOSE BIOSYNTHESIS IN FIBER PRODUCING

INVENTOR(S): JOANNE ELIZABETH BURN ET AL.

APPLN. NO.: 10/733,407

SHEET 2 OF 8

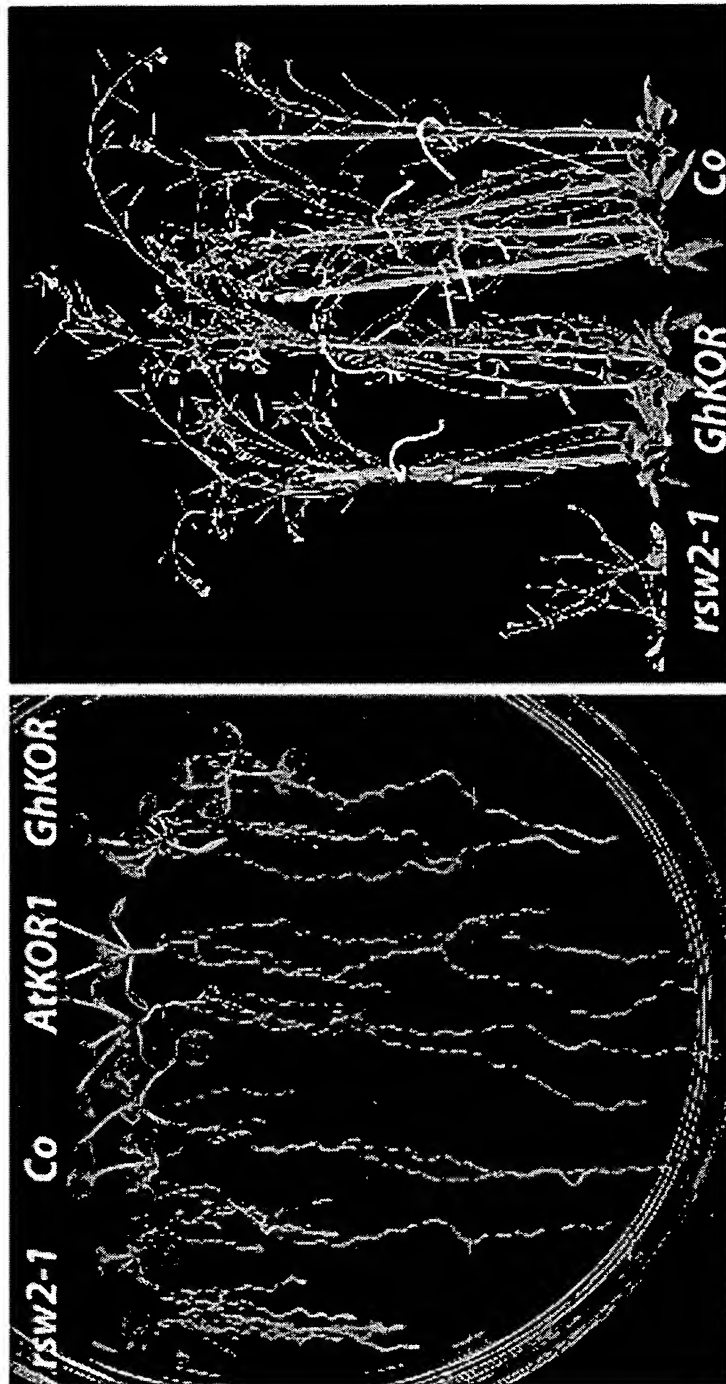


Figure 2

REPLACEMENT SHEET

APPLN. FILING DATE: DECEMBER 12, 2003

TITLE: METHODS AND MEANS FOR MODULATING
CELLULOSE BIOSYNTHESIS IN FIBER PRODUCING

INVENTOR(S): JOANNE ELIZABETH BURN ET AL.

APPLN. NO.: 10/733,407

SHEET 3 OF 8

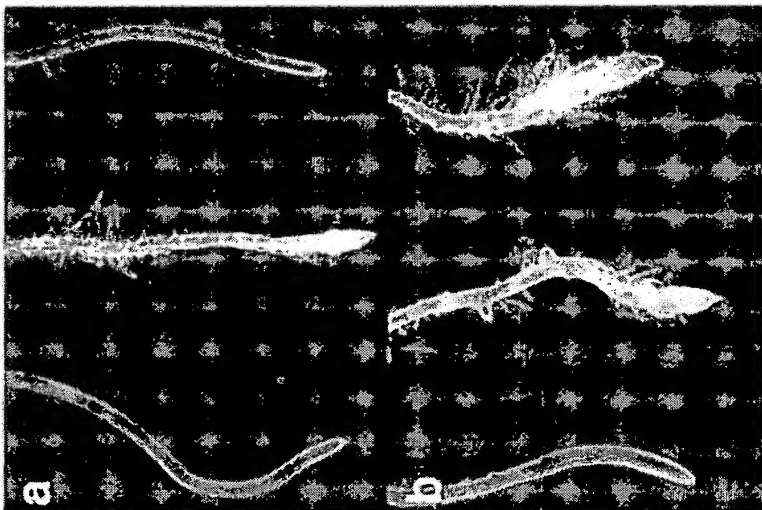


Figure 3

Arabidopsis	1	-----MRS---LLFLVSLICFCQATLSWKKKEEFSCDTPFCRRAR---SRTPGA--CSLIVGVSTIDGDAVAKLPKAPNQGDQIKPILLSVYKDGIVRLKIDEDHSIN
potato	1	-----MRAPLLLVPLLLLLLVTSAYSKKEEFNCDTPFCRRAR---SKRPGS--CNLRVADVSTIDGDAVAKLPKAPNQGDQIKPILLSVYKDGIVRLKIDEDHSIN
mouse	1	MAAIAAARARRRRSLVSLVILVGLVCLGTLTAVDSNFKTCDPSFCRRAR---SIRPGSLPYRALITLQGPDAITVLIHVEYTK-----VLWLEQGLQKMMTRKIDEDHSIN
yeast	1	-----MRVHIGICWFIQAAIIFAIPLGSCQCAFRRDENTAECDGFAERNDLAKFQKLNWNGLFQNLNSISYNGVSVGFEOQS--ENGENQHLFPFSLFKNDVVFQFQDE-----
Arabidopsis	104	PRKPRKQVDPVVSFEFKKIMLQKATE---TISGDTSSSSVVVSDGFEAVRHPD---FEVYVP-----SKSGDRRRRVVS
potato	106	PRKPRKQVDPVVSFEFKKIMLQKATE---TISGDTSSSSVVVSDGFEAVRHPD---FEVYVP-----E-SGSGKRVLS
mouse	108	PRKPRKQVDPVVSFEFKKIMLQKATE---TISGDTSSSSVVVSDGFEAVRHPD---FEVYVP-----E-SGSGKRVLS
yeast	108	-----KSLGEGTVEYEXMILTKRREDASTELGFNERRAEVYGRDAHLEQSTSLTIRYSGHGRFTIVTFSS-----PFKEFEFORGEPOVY
Arabidopsis	176	LRSHGDFDFEOLG-----RRTGDNWEEKERTHDSRPSGOSIGDFVSFYSFVAGIPEHATSPALRFTKPGCVBEE-SEPYRLFNLDVFEYDHESPGLYSGIPFVSHKSGKSTS
potato	177	LRSHGDFDFEOLG-----RRTGDNWEEKERTHDSRPSGOSIGDFVSFYSFVAGIPEHATSPALRFTKPGCVBEE-SEPYRLFNLDVFEYDHESPGLYSGIPFVSHKSGKSTS
mouse	228	LRSHGDFDFEOLG-----RRTGDNWEEKERTHDSRPSGOSIGDFVSFYSFVAGIPEHATSPALRFTKPGCVBEE-SEPYRLFNLDVFEYDHESPGLYSGIPFVSHKSGKSTS
yeast	189	LRSHGDFDFEOLG-----RRTGDNWEEKERTHDSRPSGOSIGDFVSFYSFVAGIPEHATSPALRFTKPGCVBEE-SEPYRLFNLDVFEYDHESPGLYSGIPFVSHKSGKSTS
Arabidopsis	288	GEFWLNAAEACIDVLANGWDAESG-----ISLPSSSHRIDTSMSSAGIVDTFEVGPEPKDVVKQASVGTSTAMPQLEATGCHQCRWNYKDEEDVAQVDSKEDEHDIPYDVLWLDIE
potato	290	GEFWLNAAEACIDVLANGWDAESG-----ISLPSSSHRIDTSMSSAGIVDTFEVGPEPKDVVKQASVGTSTAMPQLEATGCHQCRWNYKDEEDVAQVDSKEDEHDIPYDVLWLDIE
mouse	334	GEFWLNAAEACIDVLANGWDAESG-----ISLPSSSHRIDTSMSSAGIVDTFEVGPEPKDVVKQASVGTSTAMPQLEATGCHQCRWNYKDEEDVAQVDSKEDEHDIPYDVLWLDIE
yeast	307	GEFWLNAAEACIDVLANGWDAESG-----ISLPSSSHRIDTSMSSAGIVDTFEVGPEPKDVVKQASVGTSTAMPQLEATGCHQCRWNYKDEEDVAQVDSKEDEHDIPYDVLWLDIE
Arabidopsis	402	HPGKRYFTWBSVILFPEBEEOKLALAKGRKRWITLVDPHRRDSTFTHKDATQGYXVADSSKDC-EDGWCWPGSSSYHMLSPELRKMWGRFSKKNYVGSTPSLYIWNNDMNEPSVFN
potato	406	HPGKRYFTWBSVILFPEBEEOKLALAKGRKRWITLVDPHRRDSTFTHKDATQGYXVADSSKDC-EDGWCWPGSSSYHMLSPELRKMWGRFSKKNYVGSTPSLYIWNNDMNEPSVFN
mouse	454	HPGKRYFTWBSVILFPEBEEOKLALAKGRKRWITLVDPHRRDSTFTHKDATQGYXVADSSKDC-EDGWCWPGSSSYHMLSPELRKMWGRFSKKNYVGSTPSLYIWNNDMNEPSVFN
yeast	414	HPGKRYFTWBSVILFPEBEEOKLALAKGRKRWITLVDPHRRDSTFTHKDATQGYXVADSSKDC-EDGWCWPGSSSYHMLSPELRKMWGRFSKKNYVGSTPSLYIWNNDMNEPSVFN
Arabidopsis	521	GPEVTPRDLAHVGVGVEHREHNAAGYFHMATSDGLVMBEKKDRPEVLSPAFIFGTORYGAIWTGNTAEWEHLRVSIIPMILTLGLTGIITGSGADIGGFGFNGNPELLAVRWYQVGAYY
potato	525	GPEVTPRDLAHVGVGVEHREHNAAGYFHMATSDGLVMBEKKDRPEVLSPAFIFGTORYGAIWTGNTAEWEHLRVSIIPMILTLGLTGIITGSGADIGGFGFNGNPELLAVRWYQVGAYY
mouse	573	GPEVTPRDLAHVGVGVEHREHNAAGYFHMATSDGLVMBEKKDRPEVLSPAFIFGTORYGAIWTGNTAEWEHLRVSIIPMILTLGLTGIITGSGADIGGFGFNGNPELLAVRWYQVGAYY
yeast	533	GPEVTPRDLAHVGVGVEHREHNAAGYFHMATSDGLVMBEKKDRPEVLSPAFIFGTORYGAIWTGNTAEWEHLRVSIIPMILTLGLTGIITGSGADIGGFGFNGNPELLAVRWYQVGAYY
Arabidopsis	641	PFPRGHAHHTKRRREPWLFGERNTELMRDALHTRYTLIPFYFTLFRANVTGVPVRPLWMTFEDATFSDNDAFVUG-SGLLVQGVYTKGTQASVYLPG-KESYDIHRNGKTYVCGK
potato	645	PFPRGHAHHTKRRREPWLFGERNTELMRDALHTRYTLIPFYFTLFRANVTGVPVRPLWMTFEDATFSDNDAFVUG-SGLLVQGVYTKGTQASVYLPG-KESYDIHRNGKTYVCGK
mouse	693	PFPRGHAHHTKRRREPWLFGERNTELMRDALHTRYTLIPFYFTLFRANVTGVPVRPLWMTFEDATFSDNDAFVUG-SGLLVQGVYTKGTQASVYLPG-KESYDIHRNGKTYVCGK
yeast	653	PFPRGHAHHTKRRREPWLFGERNTELMRDALHTRYTLIPFYFTLFRANVTGVPVRPLWMTFEDATFSDNDAFVUG-SGLLVQGVYTKGTQASVYLPG-KESYDIHRNGKTYVCGK
Arabidopsis	759	THKDAPESTIPAPKACTIIPRKRDRSSQNDPXTLVWALNSS-QPEGELYIDDGKSEFF-EGSTHRRREVFSGKGVFTSTN-----LAPPEARLSSQCLIRILLIGHSSGP
potato	763	THKDAPESTIPAPKACTIIPRKRDRSSQNDPXTLVWALNSS-QPEGELYIDDGKSEFF-EGSTHRRREVFSGKGVFTSTN-----LAPPEARLSSQCLIRILLIGHSSGP
mouse	812	THKDAPESTIPAPKACTIIPRKRDRSSQNDPXTLVWALNSS-QPEGELYIDDGKSEFF-EGSTHRRREVFSGKGVFTSTN-----LAPPEARLSSQCLIRILLIGHSSGP
yeast	772	THKDAPESTIPAPKACTIIPRKRDRSSQNDPXTLVWALNSS-QPEGELYIDDGKSEFF-EGSTHRRREVFSGKGVFTSTN-----LAPPEARLSSQCLIRILLIGHSSGP
Arabidopsis	871	KSALVEPLNOKAEIEMGPLRMGLVASSGKTVLTIRKPGVRVDDQWTKIL
potato	873	KSALVEPLNOKAEIEMGPLRMGLVASSGKTVLTIRKPGVRVDDQWTKIL
mouse	992	KSALVEPLNOKAEIEMGPLRMGLVASSGKTVLTIRKPGVRVDDQWTKIL
yeast	887	KSALVEPLNOKAEIEMGPLRMGLVASSGKTVLTIRKPGVRVDDQWTKIL

Figure 4

Arabidopsis	1	MRVVVSSVSVSLQISLILASAIRSSSPNDPFTGISPODEXVYRSSE--IKKDGSKKTKAQLNDDFCDCSDGTDERTGTSACPTGKFCYCPMAHSPWILFSSRVNDGICDCCD
Rice	1	-----LGLHAILLILLIRISASAAARPLD-TTIGIPQDERVFRGG-V--IRCRDGSGRFARLKLNDFFCDPCDGTDEGTGTSACPEKFCYCNAGHSPITIFSSRVNDGICDCCD
Mouse	1	-----MLLILLILLLCHWAEVVRP-----GVLSNHHEVESKP--FTCLDGTATIPFDQVNDYCDCKGSDERTGTAQPNSEFTNTGKPLTILSSRVNDGVCDCD
Yeast	1	-----MKFSQWYTLTAPLLISSLYTVNAANDLR-----GVASDKSDLYRPAKGNWKLGSDDLISFNQVNDYCDPCDGSDEGTGTSACHNEKFECKNTGISSYILPSNRVDTVCDCD
Arabidopsis	119	GSDEYDGHVSCQNTCMWAGRAAREMCKKTIYNOGLVIRREIEQARVGLGKDAEELKKLSEQRILKGLVDQDKRBOIERVEEKERLOKERDEK-EKKEBELAAQOGR--GDAREK
Rice	108	GSDEYDSNTCKNTCMWAGRAARDKKKVATVSGVVRNREIQARVAFAPKDEEELAKLKEEKILQGLVWKTEOKKLIENAEERERLKEKEEKRMKEEAKQKQADEKKASDAQOE
mouse	102	CTDEXNSGTVCENTCRKGRKRESEQLAEVTEGFFKTKILLIEWETAFBEKSKLLELOAKGSSHEDQVETTRAAKGEAEPEKPEKADQHRRLWEEQOAAAKARREQERAAAFQEL
yeast	111	GSD--ESLITCPATCAQKAREYLATIEEHRNLVENGKAIPEQWALESAKKTDEVKARYREISDSLVASPEKTOUSEKVEKREKRESTDLCGAEAVLPSPQDLRVALLSLVDER-----NEM
Arabidopsis	236	TQDSKVEESSHDEGTPAVSQHDETTHHDEIGNYKDYPSDERPAAGEPTISILDEATHNPADEHVVRKEESTSSSDSSPTDESQNDGSAEKESDEVKKVEDFVTEKKEELSKPEFG
Rice	228	VPSQNHETVQEDSKVAEHHDGHASHDNHT-----PESESSVQHDPPSQDPLSIIKAAPADESPPEETSAAPTKEQESTPADS-----EGLSRBELG
Mouse	222	DNMGCVSAELCTHPELDTDGGALSEEE-----AQAALISGDTQTDTSFYDRVWAAIRPKYREVPPTDIPVPEPEPKE-----EKPP
Yeast	224	CERLITLNLDELTLLEYTDKDFEMKRAILS-----FEDLKEQEIARRKYSDDVHNYLESNCNHLMLTGPSEDTITFSSLIKD-----IK
Arabidopsis	356	RLVASRWTEKSKPTEDDIPKADPOENUEHTPITAHEAD-----EDDGFSVSGDEDTSDDGKYSDEHPEDDSYEEERYRHS-----SSSYKSDADDVD--FSETTSN---PTWLEKIQKTV
Rice	317	RLVASRWTEKVPDEVSKDKNEHEAHDMPEHSETHEDESVDPESAEDSVAGVHSEVEDDRHKYDDEDFSHES--DDEYVDDHDEHVASYKSDDDQKGDHSDFTASGOASWLDKIQTV
Mouse	304	VLPPEEEEEEPEPEEEEEEAPPLQPPQPPSPPT-----EDKMPPYDEET-----
Yeast	306	KILNSLVWNKLSLINFGLSPSASSTPLTQSES-----
Arabidopsis	465	KNILLAVNLFOITTPVDKSEDRVRKEVDESSSKNKIOSRISLEKKLKQDFGPKKEVYSHGRCFFSKQKNTYKVCNKEATQCE--EGYSTRLGEMDKFENS-----IQFMSITNGEK
Rice	436	QNVLTFTNEFKT--PVDLSEGRVRKBYDDASSKSKIOSRISLTLTKLKHDFGKKEFYFYDQCFFSKKEGVYKVCPEKASQV--EGHSTTSLGRMDKEES-----VRVCFSSNGDR
Mouse	357	-----QAIIDAEAPAFSEEVERSKEMEESISLEQEISDFDGSGEFAYLYSCCYELTTTNETVTRLCPEFNLVSCQPKHGGSTSLGTTGSSWAGPDHDKESAMKTEOGTG
Yeast	340	-----YRFEAAQORDIDAAEENEKSLKEHTKLMHELEYHHG-WDLRAIKGMETKREIEGCTTKVVFENVETD-----SILLGNFASQEGN-----VAKYENQOS
Arabidopsis	579	CWNGFDRSLKVKIRCGILKHELDMDVDEPSRCEYAAILSTPARCTEDKLKLEQCKLEKLMQDKP-----QNHDEL
Rice	549	CWNGFDRSLKVKIRCGILKHELDMDVDEPSRCEYAAVLSPPALGDEQKLKLEQCKLKASSN-----QRHDEL
Mouse	464	CWNGENRSTVRLTCGKETVVTSTTEPSRCEYLMELMPPAAPPPEAPSD-----GDHDEL
Yeast	431	CWNGFDRSAIVTVECGVENEIVSVLEAQKCEYLKKKSPASPDQLKQSLINTQNSALEDVANGMEDKESSVDEL

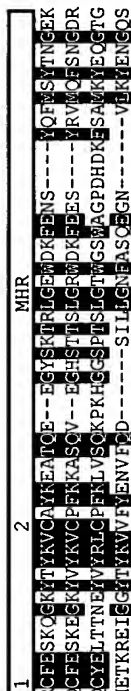


Figure 5

Substrate
 recognition

REPLACEMENT SHEET

APPLN. FILING DATE: DECEMBER 12, 2003

TITLE: METHODS AND MEANS FOR MODULATING
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INVENTOR(S): JOANNE ELIZABETH BURN ET AL.

APPLN. NO.: 10/733,407

SHEET 6 OF 8

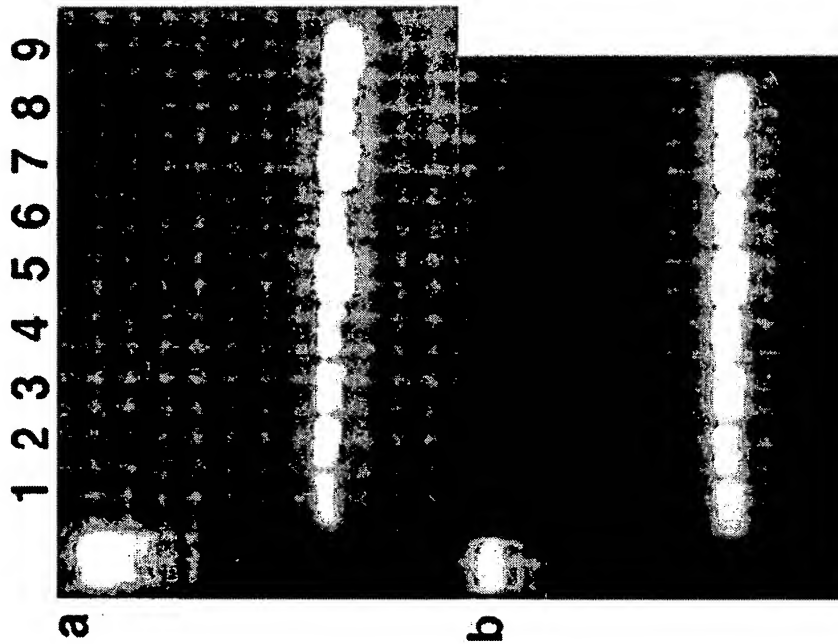


Figure 6

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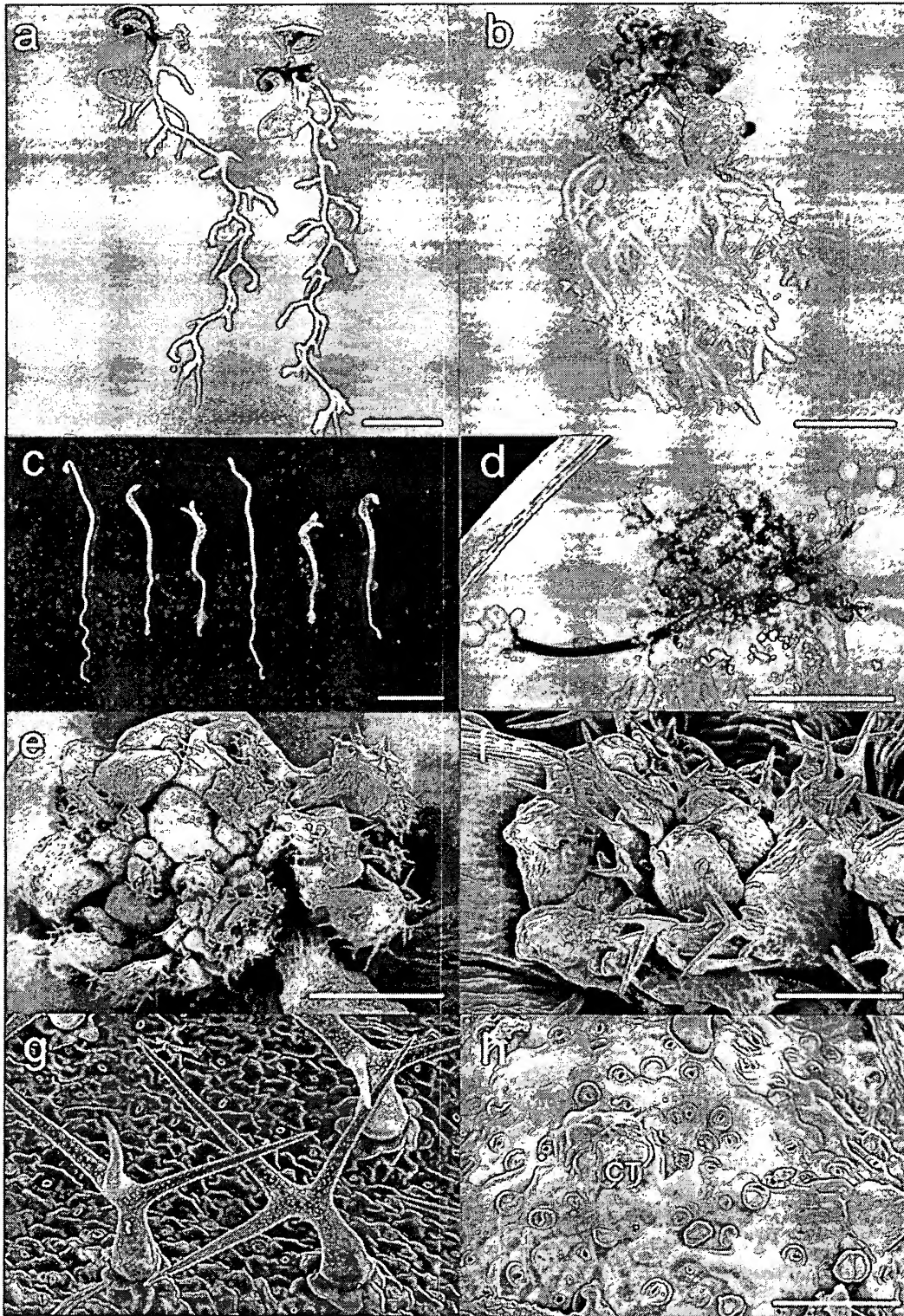


Figure 7

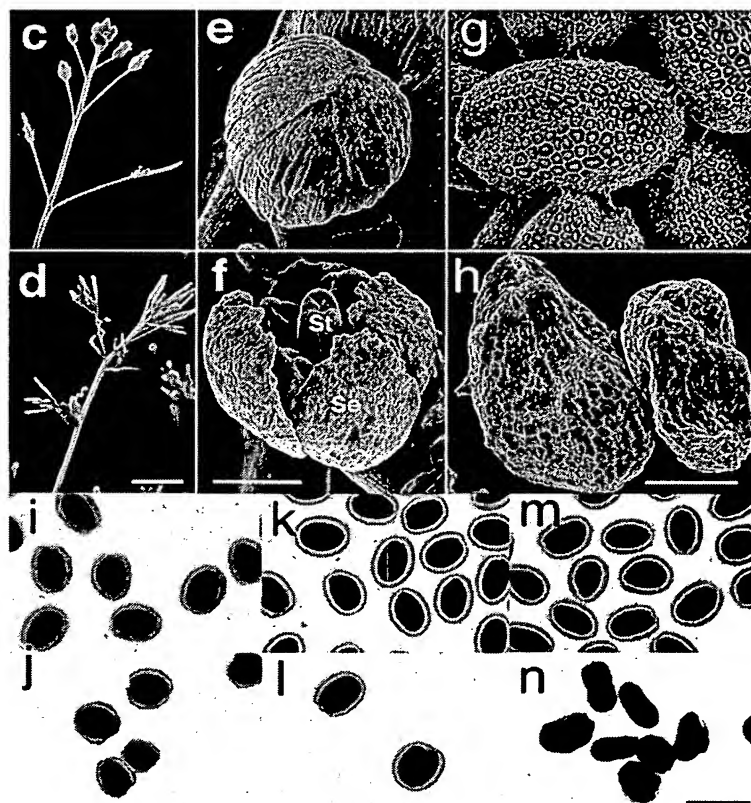
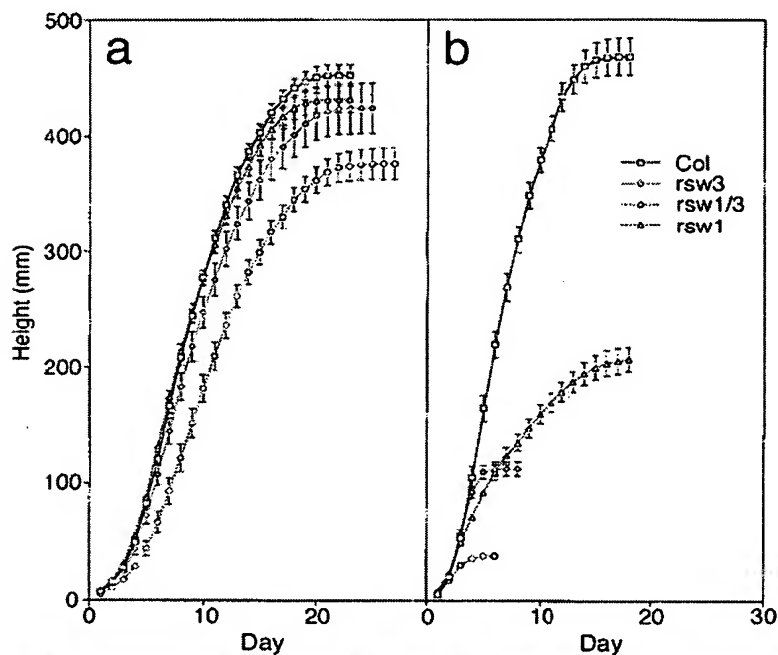


Figure 8